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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,674	08/29/2003	Nir Sasson	TI-33781	2542
23494	7590	06/29/2007		
TEXAS INSTRUMENTS INCORPORATED			EXAMINER	
P O BOX 655474, M/S 3999			TORRES, JUAN A	
DALLAS, TX 75265				
			ART UNIT	PAPER NUMBER
			2611	
			NOTIFICATION DATE	DELIVERY MODE
			06/29/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/652,674	SASSON ET AL.	
	Examiner Juan A. Torres	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 04 June 2007.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-14 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-14 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 04 June 2007 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    - a) All    b) Some \* c) None of:
      1. Certified copies of the priority documents have been received.
      2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
      3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                        | Paper No(s)/Mail Date. _____.                                     |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____. | 5) <input type="checkbox"/> Notice of Informal Patent Application |
|   | 6) <input type="checkbox"/> Other: _____.                         |

## **DETAILED ACTION**

### ***Drawings***

The modifications to the drawings were received on 06/04/2007. These modifications are accepted by the Examiner.

In view of the amendment filed on 06/04/2007, the Examiner withdraws drawing objections of the previous Office action.

### ***Specification***

The modifications to the specification were received on 06/04/2007. These modifications are accepted by the Examiner.

In view of the amendment filed on 06/04/2007, the Examiner withdraws specification objections of the previous Office action.

### ***Claim Objections***

The modifications to the claims were received on 06/04/2007. These modifications are accepted by the Examiner.

In view of the amendment filed on 06/04/2007, the Examiner withdraws claim objections to claim 12-14 of the previous Office action.

### ***Claim Rejections - 35 USC § 101***

The modifications to the claims were received on 06/04/2007. These modifications are accepted by the Examiner.

In view of the amendment filed on 06/04/2007, the Examiner withdraws claim rejections under 35 USC § 101 to claim 15 of the previous Office action.

***Claim Rejections - 35 USC § 112***

The modifications to the claims were received on 06/04/2007. These modifications are accepted by the Examiner.

In view of the amendment filed on 06/04/2007, the Examiner withdraws claim rejections under 35 USC § 112 second paragraph to claim 15 of the previous Office action.

***Response to Arguments***

**Regarding Mohindra:**

Applicant's arguments, see Amendment - After Non-Final Rejection, filed 06/04/2007, with respect to Mohindra have been fully considered and are persuasive. The rejections of claims 7 and 15 under Mohindra have been withdrawn.

**Regarding Landing:**

Applicant's arguments, see Amendment - After Non-Final Rejection, filed 06/04/2007, with respect to Mohindra have been fully considered and are persuasive. The rejections of claims 7 and 15 under Landing have been withdrawn.

**Regarding Chien:**

Applicant's arguments filed on 06/04/2007 have been fully considered but they are not persuasive.

The Applicant contends "Claims 1-15 were rejected under 35 U.S.C. §102(a) as being anticipated by Chien (US 20040203472 A1). Applicant traverses this rejection. Embodiments of the claims digitally work directly on the useful signal even the amplified noise and do not require injection of an external signal".

The Examiner disagrees and asserts, that:

Regarding claim 2:

Claim 2 stated that “the receive mode gain and phase parameters are selectively estimated in response to amplified noise or an external test signal” (emphasis added).

Regarding claims 1, and 3-14:

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., “the claims digitally work directly on the useful signal even the amplified noise and do not require injection of an external signal”) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

For this reason and the reasons indicated in the previous Office action, and the rejections of claims 1-14 are maintained.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 7-14 and 1-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Chien (US 20040203472 A1).

Regarding claim 7, Chien discloses a up/down conversion transceiver comprising a receiver operating at a local oscillator frequency (abstract, paragraphs [0020]-[0027]; figure 7 receiver part paragraphs [0082]-[0086]; and [0088]-[0099]); and a transmitter operating at the local oscillator frequency, wherein the receiver and transmitter, independently of one another, are each configured to digitally cancel its respective gain and phase impairments (abstract, paragraphs [0020]-[0027]; figure 7 transmitter part paragraphs [0082]-[0086]; and [0088]-[0099]).

Regarding claim 8, Chien discloses claim 7, Chien also discloses an analog down converter operational in association with a plurality of A/D converters to generate in-phase signals and quadrature signals in response to passband RF input signals (figure 7 blocks 710, 712, 722 and 724 paragraphs [0082]-[0086]); a digital gain equalizer operational in response to the in-phase and quadrature signals to cancel a estimated receive gain error when the transceiver is in receive mode and further operational to estimate a transmit gain error when the transceiver is in transmit mode (figure 7 blocks 728 and 740; paragraphs [0083]-[0084]; figures 16A and 16B for the receiver and figures 17A and 17B for the transmitter multiplier in the Q channel paragraphs [0122]-[0164]); a digital phase estimator operational in response to the in-phase and quadrature signals to generate a estimated receive phase error when the transceiver is in receive mode and further operational to estimate a transmit phase error when the transceiver is in transmit mode (figure 7 blocks 726 and 776; paragraph

[0083]; figures 19-27 paragraphs [0129]-[0183]); and a receiver digital phase equalizer operational to cancel the estimated receive phase error (figure 7 blocks 728 and 740; paragraphs [0083]-[0084]; figures 16A and 16B for the receiver and figures 17A and 17B for the transmitter adder in the I channel paragraphs [0122]-[0164]).

Regarding claim 9, Chien discloses claim 8, Chien also discloses that the transmitter is operational to generate up-converted passband RF input signals having canceled transmit gain and phase imbalances in response to the passband RF input signal, the estimated transmit gain error and the transmit phase error (figure 7 blocks 740, 776, 774, 742, 756 and 758 paragraphs [0082]-[0086]).

Regarding claim 10, Chien discloses claim 7, Chien also discloses means for generating in-phase signals and quadrature signals in response to passband RF input signals (figure 7 blocks 710, 712, 722 and 724 paragraphs [0082]-[0086]); means responsive to the in-phase and quadrature signals for digitally canceling a estimated receive gain error when the transceiver is in receive mode and for estimating a transmit gain error when the transceiver is in transmit mode (figure 7 blocks 728 and 740; paragraphs [0083]-[0084]; figures 16A and 16B for the receiver and figures 17A and 17B for the transmitter multiplier in the Q channel paragraphs [0122]-[0164]); means responsive to the in-phase and quadrature signals for generating a estimated receive phase error when the transceiver is in receive mode and for estimating a transmit phase error when the transceiver is in transmit mode (figure 7 blocks 726 and 776; paragraph [0083]; figures 19-27 paragraphs [0129]-[0183]); and means for digitally canceling the estimated receive phase error (figure 7 blocks 728 and 740; paragraphs [0083]-[0084];

figures 16A and 16B for the receiver and figures 17A and 17B for the transmitter adder in the I channel paragraphs [0122]-[0164]).

Regarding claim 11, Chien discloses claim 10, Chien also discloses that the means for generating in-phase signals and quadrature signals comprises an analog down converter operational in association with a plurality of A/D converters (figure 7 blocks 710, 712, 722 and 724 paragraphs [0082]-[0086]).

Regarding claim 12, Chien discloses claim 11, Chien also discloses that the means responsive to the in-phase and quadrature signals for canceling an estimated receive gain error comprises a digital gain equalizer (figure 7 blocks 728 and 740; paragraphs [0083]-[0084]; figures 16A and 16B for the receiver and figures 17A and 17B for the transmitter multiplier in the Q channel paragraphs [0122]-[0164]).

Regarding claim 13, Chien discloses claim 12, Chien also discloses the means responsive to the in-phase and quadrature signals to generate a estimated receive phase error comprises a digital phase estimator (figure 7 blocks 726 and 776; paragraph [0083]; figures 19-27 paragraphs [0129]-[0183]).

Regarding claim 14, Chien discloses claim 13, Chien also discloses that the means for digitally canceling the estimated receive phase error comprises a receiver digital phase equalizer (figure 7 blocks 728 and 740; paragraphs [0083]-[0084]; figures 16A and 16B for the receiver and figures 17A and 17B for the transmitter adder in the I channel paragraphs [0122]-[0164]).

Regarding claim 1, Chien discloses estimating gain and phase imbalance parameters in receive mode during transceiver power-up (figure 10 block s1006

paragraph [0105]); digitally canceling the receive mode gain and phase imbalance in response to the estimated parameters (figure 10 block s1010 and figures 12A and 12B paragraphs [0105]-[0109]); switching the transceiver to transmit mode subsequent to cancellation of the receiver gain and phase imbalance (figure 10 block s1012 and figures 13A and 13B paragraphs [0110]-[0112]); transmitting a signal back into the receiver via the transceiver transmitter subsequent to switching to the transmit mode (figure 10 blocks s1012 and s1010 RX line and figures 12A and 12B paragraphs [0105]-[0109]); re-estimating gain and phase imbalance parameters subsequent to transmission of the signal back into the receiver (figure 10 block s1010 and figures 12A and 12B paragraphs [0105]-[0109]), and generating transmit mode gain and phase impairments there from (figure 10 block s1012 and figures 13A and 13B paragraphs [0110]-[0112]); and digitally canceling transmit mode gain and phase imbalance in response to the estimated impairments (figure 10 block s1012 and figures 13A and 13B paragraphs [0110]-[0112]).

Regarding claim 2, Chien discloses claim 1, Chien also discloses that the receive mode gain and phase parameters are selectively estimated in response to amplified noise or an external test signal (figure 9 and figure 10 block s1006 paragraphs [0100]-[0105]; figure 9 block S918] and paragraph [0102] specifically discloses the test signal).

Regarding claim 3, Chien discloses claim 1, Chien also discloses that the receive mode gain and phase parameters are selectively estimated in response to a received passband input signal.

Regarding claim 4, Chien discloses claim 1, Chien also discloses that the receive mode gain and phase imbalance is digitally canceled in a feed forward manner (figures 33-38B paragraphs [0253]-[0258]).

Regarding claim 5, Chien discloses an analog down converter operational in association with a plurality of A/D converters to generate in-phase signals and quadrature signals in response to passband RF input signals (figure 7 blocks 710, 712, 722 and 724 paragraphs [0082]-[0086]); a digital gain equalizer operational in response to the in-phase and quadrature signals to cancel a estimated receive gain error when the transceiver is in receive mode and further operational to estimate a transmit gain error when the transceiver is in transmit mode (figure 7 blocks 728 and 740; paragraphs [0083]-[0084]; figures 16A and 16B for the receiver and figures 17A and 17B for the transmitter multiplier in the Q channel paragraphs [0122]-[0164]); a digital phase estimator operational in response to the in-phase and quadrature signals to generate a estimated receive phase error when the transceiver is in receive mode and further operational to estimate a transmit phase error when the transceiver is in transmit mode (figure 7 blocks 726 and 776; paragraph [0083]; figures 19-27 paragraphs [0129]-[0183]); a receiver digital phase equalizer operational to cancel the estimated receive phase error (figure 7 blocks 728 and 740; paragraphs [0083]-[0084]; figures 16A and 16B for the receiver and figures 17A and 17B for the transmitter adder in the I channel paragraphs [0122]-[0164]); and a transmitter operational to generate up-converted passband RF input signals having canceled transmit gain and phase imbalances in response to the passband RF input signal, the estimated transmit gain error and the

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transmit phase error (figure 7 blocks 740, 776, 774, 742, 756 and 758 paragraphs [0082]-[0086]).

Regarding claim 6, Chien discloses claim 5, Chien also discloses that receive and transmit portions of the transceiver are configured to operate with the same local oscillator frequency and are further configured to operate with independent phase and gain impairments (figure 7 block 764; blocks 726, 730 and 728 for the receiver and blocks 776, 774 and 742 for the transmitter paragraphs [0082]-[0086]).

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is 571-272-3119. The examiner can normally be reached on 8-6 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Juan Alberto Torres  
06-07-2007

TEMERGHEN GHEBRETISSA  
(PRIMARY EXAMINER)